

ALTERNOCHELATA LIZARDENSIS, A NEW SPECIES
OF MYODOCOPINE OSTRACODE FROM THE GREAT
BARRIER REEF OF AUSTRALIA (RUTIDERMATIDAE)

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Abstract.—*Alternochelata lizardensis* is described and illustrated. The specimens were collected from the Lizard Island Group, Great Barrier Reef, Australia. The genus was known previously only from the North Atlantic.

The only previous record of a member of the Rutidermatidae Brady and Norman 1896, in Australia is a listing of *Rutiderma* sp. by Poore *et al.* (1975:31, 60, 61) among the fauna of Port Phillip Bay, Victoria. According to those authors *Rutiderma* sp. was collected in bottom samples at depths of 20–24 m; bottom salinity was 34.95‰ (Poore and Rainer 1975:373). *Alternochelata lizardensis*, the new species described here from the Lizard Island Group of the Great Barrier Reef, is a member of a genus recorded previously only from the North Atlantic, viz. the Great Bahama Bank (Kornicker 1958:237), and off Mauritania (Kornicker and Caraion 1978:66).

Alternochelata Kornicker, 1958

Type-species.—*Rutiderma (Alternochelata) polychelata* Kornicker, 1958, by monotypy.

Alternochelata lizardensis, new species

Figs. 1–6

Etymology.—The specific name refers to the type-locality, Lizard Island, Australia.

Material.—Lizard Island main lagoon; Sept–Oct 1977; undisturbed sand flat, depth 6 m; 15 replicate small cores (each 0.0044 sq. m); cores sieved through 186 μm mesh; specimens from all cores consolidated: 1 adult female, USNM 158609, holotype; 1 adult male, USNM 158489, paratype. Palfrey Island; Sept–Oct 1977, transect across sand flat from shore to reef; stations 1–3 fairly close together and above mean datum; stations 4–8 extending 150 m across sand flat; station 8 at far edge of flat adjacent to a coral head at edge of coral reef; stations 4–8 exposed probably only at extreme low tides, twice a year. Sand fine to medium fine, with small ripple marks, but not exposed to much wave action; tube-dwelling polychaetes and other more-or-less sedentary animals fairly abundant; 5 large cores (each 0.0176 sq. m) taken from each of 8 stations (ostracodes present in only 5 outer stations); cores sieved through 500 μm mesh; specimens from each station consolidated: Station 5, 1 A-1 male, USNM 158029, paratype; Station 6: 1 adult male, USNM 158487, paratype; 3 adult females, USNM 158606A, C, D, paratypes; 1 ovigerous female, USNM 158606B, paratype; 5 juveniles, USNM 158606E, paratypes; Station 7, 3 adult males, USNM 158605, paratypes; Station 8: 1 oviger-

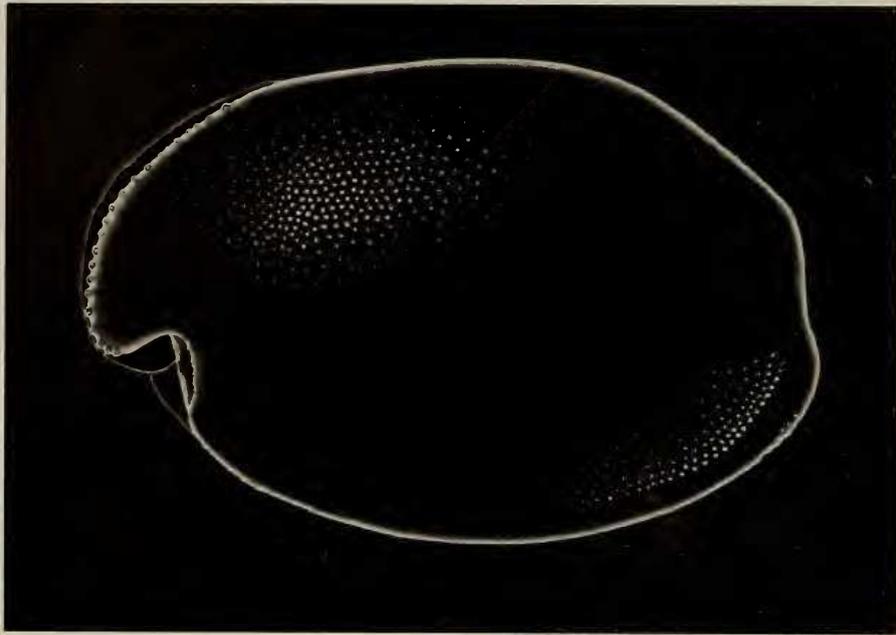


Fig. 1. *Alternochelata lizardensis*, A-1 male, paratype, USNM 158029, lateral view of complete specimen, length 1.29 mm.

ous female, USNM 158488, paratype; 7 paratypes including adult males, females, and juveniles, deposited in The Australian Museum, Sydney. Palfrey Island; Sept–Oct 1977, active sand cones; on sand flat at depth of 12.3 m; 10 replicate small cores (each 0.0044 sq. m); cores sieved through 186 μm mesh; specimens from all replicate cores consolidated: 3 juveniles, USNM 158607, paratypes.

Description of A-1 male (Figs. 1–3e).—Carapace ovoid with narrow but distinctly projecting caudal process; incisur well developed with slightly overhanging rostrum (Figs. 1, 2a).

Ornamentation (Figs. 1, 2d): Surface with numerous shallow fossae; lateral ribs absent; anterior margin of rostrum, and also anteroventral and ventral margins of valve with minute scallops; scallops absent in vicinity of incisur, and also along posterior one-fourth of ventral margin of valve, in vicinity of caudal process, and along posterior and dorsal margins of valve; bristles numerous along edge of rostrum, and also along anteroventral and ventral margins of valve; bristles sparsely distributed over lateral surface; most long bristles with broad basal part.

Infold (Fig. 2a,c): Rostral infold with 8 or 9 long spinous bristles forming row, and 1 shorter spinous bristle near inner end of incisur (Fig. 2a); 1 small bristle at inner end of incisur not on infold (Fig. 2a); anteroventral infold with 1 short bristle (just ventral to inner end of incisur) followed by space and then 6–8 longer bristles forming row parallel to valve edge; about 7 parallel ridges present on anteroventral infold dorsal to bristles; narrow list present having anterior end located on ventral infold at point about one-third length of valve measured from posterior end of caudal process; list continuing onto infold of caudal process and ending on posterior infold dorsal to caudal process (Fig. 2c); 19–23 minute bristles (some forming pairs) present on infold just outside list (anterior segment of list and some anterior bristles not shown on Fig. 2c); infold of caudal process with small bristle near middle (Fig. 2c).

Selvage (Figs. 1, 2b, c): Wide lamellar prolongation along anterior and ventral



Fig. 2. *Alternochelata lizardensis*, A-1 male, paratype, USNM 158029: a, Rostrum and incisur of right valve, inside view; b, Incisur of right valve showing selvage bearing striations and marginal fringe; c, Posterodorsal corner of right valve showing caudal process, infold, and smooth narrow selvage divided at corner by small bristle; d, Detail of right valve from inside showing some central adductor muscle attachment scars (lined) and fossae (unlined) (not all scars could be distinguished from fossae with certainty); e, Left 1st antenna, medial view; f, Distal part of protopodite, endopodite, and 1st joint of exopodite of right 2nd antenna, medial view; g, Right mandible, medial view; h, Left maxilla, lateral view; i, 7th limb (tips of some bristles broken); j, Detail of tip of 7th limb shown in i; k, Left lamella of furca, lateral view; l, Anterior of body from left showing left lateral eye, medial eye and Bellonci organ, and upper lip with single anterior process; m, Right Y-sclerite, anterior towards right.

margins becoming narrower in vicinity of caudal process and along posterior margin of valve; prolongation divided at inner end of incisur (Fig. 1, 2b), and divided by minute bristle at edge of caudal process (Fig. 2c); margin of prolongation with fringe of long and short hairs along anterior and ventral margins of valve, bare in vicinity of caudal process and along posterior margin (Fig. 2c); fringe on selvage in vicinity of incisur and along anterior margin of rostrum not shown in Fig. 1.

Central adductor muscle attachments (Fig. 2d): Consisting of about 18 to 24 oval scars.

Size: USNM 158029, length 1.29 mm, height 0.87 mm.

First antenna (Fig. 2e): 1st joint with slender spines on medial surface. 2nd joint with slender spines on medial surface and dorsal margin, and with 2 bristles (1 dorsal, 1 lateral). 3rd joint short, with few medial spines and 2 bristles (1 dorsal, 1 ventral). 4th joint separated from 3rd joint by distinct suture, with 4 bristles (1 dorsal, 3 ventral). Sensory bristle of 5th joint with about 6 short proximal filaments, 1 minute filament just distal to middle, and bifurcate tip (all filaments drawn out to fine point). 6th joint minute, fused to 5th joint, with short, bare, medial bristle. 7th joint: a-bristle bare, about same length as bristle of 6th joint; b-bristle about twice length of a-bristle, with 1 small proximal filament, 1 minute filament near middle, and tip with minute process; c-bristle about same length as sensory bristle of 5th joint, with 3 small proximal filaments, 1 minute filament distal to middle, and bifurcate tip (filaments drawn out to fine tip). 8th joint: d- and e-bristles slightly shorter than c-bristle, bare with blunt tips; f-bristle about one-third longer than b-bristle, with 2 short proximal filaments and bifurcate tip; g-bristle about same length as c-bristle, with 2 short proximal filaments, 1 minute filament distal to middle, and bifurcate tip (filaments drawn out to fine point). Each branch of bifurcate terminal ends of sensory bristle, as well as c-, f-, and g-bristles, with minute process at tip.

Second antenna (Fig. 2f): Protopodite bare. Endopodite 3-jointed: 1st joint short with 5 short bristles (4 proximal, 1 distal); 2nd joint elongate with 3 or 4 ventral bristles (1 long spinous, 2 or 3 short bare); 3rd joint elongate with 3 bristles (1 dorsal, 2 terminal). Exopodite: 1st joint elongate with minute, terminal, medial bristle with tubular tip; bristles of joints 2–8 short, with stout spines forming groups along ventral margins (these spines smaller in distal groups); 9th joint with 4 very short terminal bristles (ventral 2 of these with ventral spines similar to those on joints 2–8; remaining 2 bristles bare), and 2 minute medial bristles; joints 2–8 with small slender spines along distal margins; basal spines absent.

Mandible (Fig. 2g): Coxale endite stout, bifurcate, with proximal hairs and distal spines. Basale: medial side with 5 proximal bristles near ventral margin: 2 pectinate, 3 ringed (1 pectinate and 1 ringed bristle broken off on illustrated limb); dorsal margin with 3 bristles (1 near middle, 2 subterminal); lateral side with short bristle near middle of ventral margin. Exopodite absent. 1st endopodial joint with medial spines and 3 ventral bristles (2 short bare, 1 long spinous). 2nd endopodial joint: medial surface with spines forming rows near dorsal margin; dorsal margin with 7 bristles; ventral margin with 2 small terminal bristles; distal end near ventral margin with stout claw with large teeth along inner margin, and with prolonged tip having minute teeth along inner margin; a small spade-shaped pro-

cess with spine at tip present medial to stout claw. 3rd endopodial joint: distal margin with stout claw having 2 rows of teeth along inner margin; a second narrower claw present ventral to stout claw (this claw also with teeth along inner margin); medial surface with 3 short ringed bristles; lateral surface with 2 small ringed bristles.

Maxilla (Fig. 2h): Endite I with 3 spinous bristles and 2 pectinate claws; endite II with 2 bristles and 2 pectinate claws; endite III with 3 terminal pectinate claws, 3 terminal bristles, and 1 proximal bristle. Dorsal margins of precoxale, coxale, and proximal part of basale, with fringe of hairs. Coxale with short, terminal, dorsal bristle. Basale with 1 ventral bristle, and 2 medial bristles (1 of these near dorsal margin, other distal and could be interpreted to be on 1st endopodial joint). Exopodite small with 3 bristles (2 short, 1 long). 1st endopodial joint with dorsal spines, 1 spinous alpha-bristle and 1 spinous beta-bristle. 2nd endopodial joint with 2 stout pectinate claws and 5 slender bristles, some with marginal spines.

Fifth limb (Fig. 3a–d): Epipodial appendage with 48 bristles. Endite I with 1 or 2 short, ringed, spinous bristles and 1 minute unringed bristle; endite II with 3 short, ringed, spinous bristles and none or 1 minute unringed bristle; endite III with 8 bristles (1 inner anterior bristle with long proximal hairs and short distal spines adjacent to 1 minute unringed bristle; 2 short, slender pectinate bristles; and 4 ringed, slender, spinous bristles). 1st exopodial joint with proximal bristle adjacent to 2 small teeth followed by 2 curved prongs (proximal of these with distal marginal tooth; other with 2 proximal and 3 distal marginal teeth (Fig. 3d)). 2nd exopodial joint folded over on both limbs examined; consisting of large triangular tooth with 2 large teeth (distal of these with marginal tooth) along inner margin (Fig. 3d); joint with usual posterior bristles (Fig. 3b); outer corner of triangular tooth with small bristle with long hairs (Fig. 3a); 3rd exopodial joint with 2 bristles (with minute marginal teeth) on inner lobe, and 2 bristles (with long marginal hairs) on outer lobe. 4th and 5th joints fused, with total of 4 bristles.

Sixth limb (Fig. 3e): Endites I and II each with 3 bristles; endite III with 4 bristles; endite IV with 3 bristles. End joint with 8 or 9 bristles (anterior 6 or 7 bristles with either short marginal spines, or long proximal hairs and short distal spines; posterior 2 bristles with long marginal hairs); ventral margin of end joint linear. Two or 3 bristles with long marginal hairs present in place of epipodial appendage. Limb without long hairs on endites or end joint.

Seventh limb (Fig. 2i,j): 3 or 4 tapering bristles in proximal group (each bristle with marginal spines and up to 3 bells); 4 tapering bristles in terminal group (each bristle with marginal spines and up to 5 bells). Terminus with comb of 9 teeth opposite 2 recurved teeth; comb consisting of 3 short teeth on each side of 3 slightly longer teeth; short teeth with alar projections on each side and tooth on each side of base.

Furca (Fig. 2k): Each lamella with 9 claws; claws 1, 2, 4, 5 stout primary claws; claws 3, 6–9, small secondary claws; claws 1 and 2 with long teeth along posterior margins (small slender teeth also present); some secondary claws with minute spines along posterior margins (not shown on illustrated limb).

Bellonci organ (Fig. 2l): Elongate, broadening in middle, with rounded tip.

Eyes (Fig. 2l): Lateral eye very faint, light amber color. Medial eye reddish in preserved specimen.

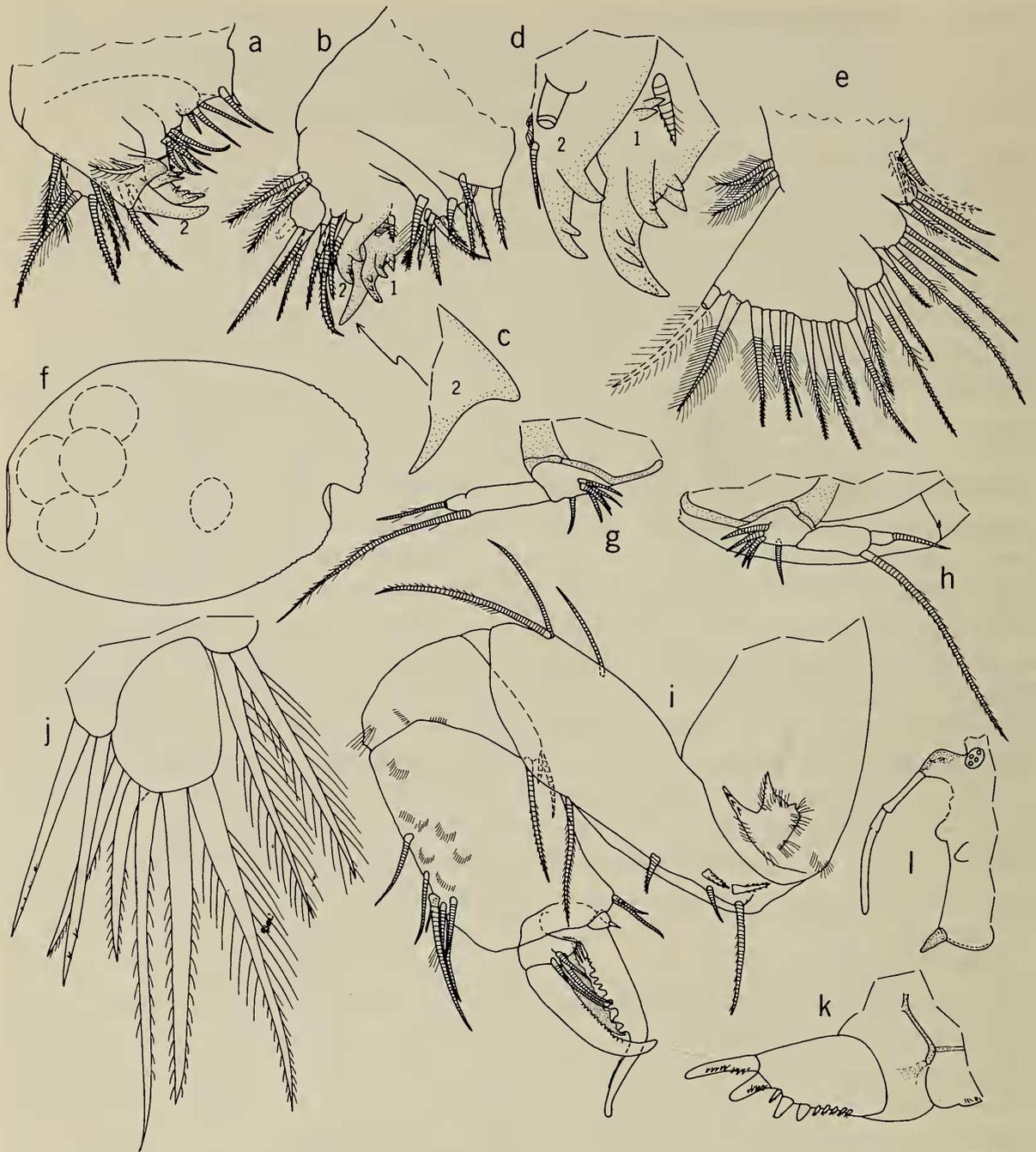


Fig. 3. *Alternochelata lizardensis*, a-e, A-1 male, paratype, USNM 158029: a, Right 5th limb, twisted but anterior view; b, Left 5th limb, twisted but mostly posterior view; c, Detail of tip of large tooth of 2nd exopodial joint; d, Detail of teeth of exopodial joints 1 and 2, from b; e, 6th limb. f-l, Adult female, paratype, USNM 158488: f, Lateral view of complete specimen showing position of 4 of 6 eggs and central adductor muscle attachments, carapace length 1.43 mm; g, Endopodite of left 2nd antenna, medial view; h, Distal part of protopodite, endopodite, and 1st joint of exopodite of right 2nd antenna, medial view; i, Right mandible, medial view; j, Distal end of 5th joint showing both lobes of 3rd joint (outer lobe to right) and fused 4th and 5th joints, from Figure 4d; k, Left lamella of furca and left Y-sclerite, lateral view; l, Anterior of body from left showing left lateral eye, medial eye and Bellonci organ, anterior process, and upper lip with single anterior process.

Upper lip (Fig. 21): Lip with single anterior process.

Y-sclerite (Fig. 2m): Posterior end forming right angle; middle segment linear, fairly long; wide angle between dorsal and ventral branches.

Description of adult female (Figs. 3f–l, 4a–e).—Similar in shape to that of a A-1 male except caudal process not so well defined (Fig. 3f).

Ornamentation: Similar to that of A-1 male.

Infold: Rostral infold with 11 or 12 long spinous bristles forming row and 2 shorter bristles near inner end of incisur; anteroventral infold with 1 short bristle just ventral to inner end of incisur followed by space and then 9 or 10 longer bristles forming row; anteroventral infold also with about 6 ridges between bristles and inner margin of infold; narrow list on infold of caudal process and posterior end of ventral margin with 20–23 minute bristles, some in groups of 2 or rarely 3 bristles but most single; 2 or 3 small bristles on infold of caudal process between list and posterior edge of valve.

Selvage: Similar to that of A-1 male.

Size: USNM 158488, length 1.43 mm, height 0.98 mm. USNM 158606A–D (4 specimens): length 1.37 mm, height 0.91 mm; length 1.41 mm, height 0.94 mm; length 1.37 mm, height 0.94 mm; USNM 158609, length 1.34 mm, height 0.91 mm.

First antenna: 4th joint with 2 long bristles on ventral margin, joints 1–4 otherwise similar to those of A-1 male. 5th joint bent ventrally as on A-1 male; sensory bristle with 3 short proximal filaments, 1 minute distal filament and bifurcate tip (each branch with minute terminal process). 6th joint fused to 5th joint, with short, bare, medial bristle. 7th joint: a-bristle bare, extends slightly past tip of bristle of 6th joint; b-bristle about twice length of a-bristle, with 1 small filament just distal to middle, and tip with minute process; c-bristle about as long as sensory bristle of 5th joint, with 1 minute proximal filament, 2 minute filaments distal 2 middle, and bifurcate tip (each branch with minute terminal process). 8th joint: d- and e-bristles slightly shorter than c-bristle, bare with blunt tips; f-bristle about one-third longer than b-bristle, with 1 minute proximal filament and bifurcate tip (each branch with minute terminal process); g-bristle as long as c-bristle, with 2 minute proximal filaments, 1 minute distal filament, and bifurcate tip (each branch with minute terminal process).

Second antenna: Protopodite bare. Endopodite either 2 or 3 jointed (Fig. 3g, h): 1st joint short, with 6 small bristles (5 proximal, 1 distal); 2nd joint elongate with 1 long spinous ventral bristle and 1 shorter, bare, terminal bristle (the latter bristle on 3rd joint when dividing suture present between ventral and terminal bristle; see (Fig. 3h)). Exopodite: 1st joint elongate, with 1 small, tubular, medial bristle on distal margin (Fig. 3h); joints 2–9 decrease in size gradually; bristles on joints 2–5 fairly short, with closely spaced, stout, short, ventral spines (forming cornlike row); ventral spines on bristles of females similar to those of A-1 male but tending to have more rounded tips; bristle on 4th joint of right limb slightly longer than bristle of 5th joint and with short slender ventral spines near tip; bristles of joints 6–8 of USNM 158488 and 158606B broken off near base (remaining part bare); 9th joint with 5 bristles (3 stout, broken off near base of USNM 158488, 2 very small, bare); joints 2–8 with small spines forming row along distal margin; basal spines absent. Long exopodial bristles of joints 6–9 on USNM 158609, 158606A, C, D, unbroken, with natatory hairs, no spines.

Mandible (Fig. 3i): Coxale endite stout, bifurcate, with proximal hairs and distal spines; medial hairs in row near base. Basale: medial side with 5 proximal bristles near ventral margin (2 short pectinate, 1 short bare, 1 longer spinous and 1 short spinous bristle nearer to middle of ventral margin); dorsal margin with 3 bristles (1 near middle, 2 subterminal); ventral margin with 1 long distal spinous bristle (base may be on lateral surface). Exopodite absent. 1st endopodial joint with medial spines and hairs forming rows; lateral side with hairs forming single distal row near dorsal margin; small ventral margin with 1 long and 2 short bristles. 2nd and 3rd endopodial joints similar to those of A-1 male.

Maxilla: Similar to that of A-1 male.

Fifth limb (Fig. 3j, 4a-d): Endite I with 2 bristles; endite II with 3 ringed spinous bristles and 1 unringed bristle; endite III with 8 bristles (similar to those of A-1 male). 1st exopodial joint with a spinous bristle proximal to 2 stout teeth, and an elongate pronglike tooth with 3 marginal teeth (Fig. 4c); 2 short anterior teeth at base of pronglike tooth (Fig. 4c); 2 bristles on anterior margin of joint (Fig. 4b, c). 2nd exopodial joint consisting of large triangular tooth with 2 large teeth along inner margin (Fig. 4b, e); 2 long bristles on inner margin proximal to proximal tooth (Fig. 4b, e); posterior side with 1 small bristle in proximal outer corner, and 3 distal bristles (Fig. 4d, e). 3rd exopodial joint with 2 bristles (with minute marginal teeth) on inner lobe, and 2 bristles (with long marginal hairs) on outer lobe; 4th and 5th joints fused, with total of 5 bristles (Fig. 3j).

Sixth limb: Endite I and II each with 3 bristles; endite III with 4 bristles; endite IV with 3 bristles. End joint with 8 ventral bristles (anterior 6 bristles with few to many long hairs near middle and small distal spines; posterior 2 bristles with long marginal hairs); ventral margin of end joint linear; 2 hirsute bristles in place of epipodial appendage; trunk with few hairs along posterior edge proximal to epipodial bristles. Limb similar to that of A-1 male (see Fig. 3e).

Seventh limb: Each limb with 6 bristles in terminal group (3 on each side) and 4 in proximal group (2 on each side; the bristles close together on comb side, and farther apart on opposite side); each bristle with marginal spines and 4-6 distal bells. Terminus consisting of comb with 9 mostly alate teeth opposite 3 spinous recurved teeth.

Furca (Fig. 3k): Each lamella with 8 to 10 (usually 9) claws; claws 1, 2, 4, 5 stout primary claws; claws 3, 6-8, 9, 10 small secondary claws; claws 1 and 2 with stout posterior teeth; secondary claws with slender posterior spines; tips of main claws rounded (appear worn down); claw 1 of right lamella anterior to claw 1 of left lamella.

Bellonci organ (Fig. 3l): Elongate; middle with short, broad segment delineated by faint sutures or folds; distal part cylindrical with rounded tip.

Eyes (Fig. 3l): Lateral eye small, unpigmented, with 4 or 5 minute ommatidia. Medial eye bare, well developed, pigmented black in central portion and having reddish tint in marginal portions when viewed with transmitted light.

Upper lip (Fig. 3l): Lip with single stout anterior process.

Posterior of body: With few hairs (Fig. 3k); forming almost right angle at dorsal end of girdle. (Girdle is posterior sclerite with ventral ends connected to posterior ends of left and right Y-sclerites.)

Y-sclerite (Fig. 3k): Posterior end bent ventrally; middle segment linear; ventral branch obscure on specimens examined.

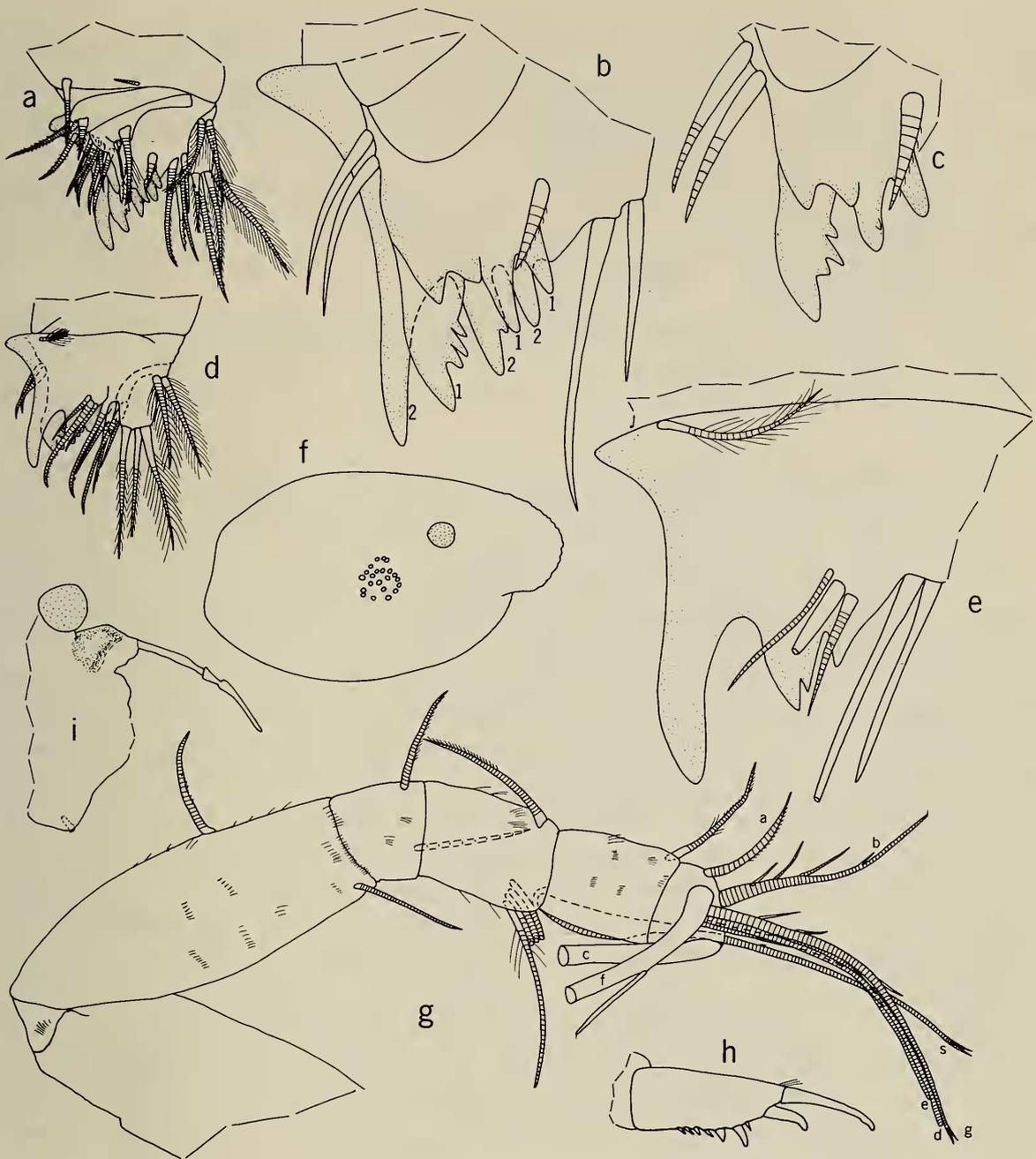


Fig. 4. *Alternochelata lizardensis*, a–e, adult female, paratype, USNM 158488, 5th limb: a, Right limb, anterior view; b, Detail of 1st and 2nd exopodial joints, from a; c, Detail of 1st exopodial joint, from b; d, Left limb, posterior view; e, Detail of 2nd exopodial joint, from d. f–i, adult male, paratype, USNM 158487: f, Complete specimen showing right lateral eye, and central adductor muscle attachments, carapace length 1.36 mm; g, Right 1st antenna (long filaments of sensory bristle of 5th joint not shown), lateral view; h, Right lamella of furca, lateral view; i, Anterior of body from right side showing right lateral eye (ommatidia not drawn), medial eye and Bellonci organ, and upper lip (anterior process of upper lip bent backward on illustrated lip).

Eggs (Fig. 3f): USNM 158488 with 6 eggs in marsupium (not all shown in illustration); USNM 158606B with 4 eggs.

Remarks: On the two ovigerous females, USNM 158488, 158606B, the long bristles on joints 6–9 of the exopodite of the 2nd antenna are broken off; whereas, these bristles on the four adult females, USNM 158609, 158606A, C, D, which

did not have extruded eggs, were unbroken and bore natatory hairs. The phenomenon of females breaking off exopodial bristles after mating, thus rendering them incapable of swimming, is common among the Philomedidae, but has been previously reported in the Rutidermatidae on only one species, *Alternochelata nealei* Kornicker and Caraion, 1978:73.

Description of adult male (Figs. 4f-i, -6).—Carapace more elongate than that of adult female and with broader rostrum (Fig. 4f).

Ornamentation: Similar to that of adult female.

Infold: Not examined.

Selvage: In vicinity of rostrum and along ventral margin similar to that of adult female, not examined elsewhere.

Central adductor muscle attachments (Fig. 4f): Similar in number to those of A-1 male.

Size: USNM 158487, length 1.36 mm, height 0.80 mm; USNM 158489, length 1.37 mm, height 0.79 mm; USNM 158605 (3 specimens): length 1.36 mm, height 0.79 mm; length 1.38 mm, height 0.81 mm; length 1.39 mm, height 0.83 mm.

First antenna (Fig. 4g): Lateral hairs forming row on soft integument between 1st and 2nd joints. Joints 2-4, and 6 with hairs and spines in rows. 2nd joint with 1 dorsal bristle, and 1 lateral bristle near ventral margin. 3rd joint short, with 1 dorsal bristle, and 1 ventral bristle with base on medial side of joint. 4th joint with 1 spinous dorsal bristle, and 4 ventral bristles with bases on medial side of joint. 5th joint minute, fused to 4th; sensory bristle with broad proximal part bearing numerous long filaments (filaments not shown on illustrated limb); distal stem of sensory bristle with 1 minute filament near middle and bifurcate tip (each branch with minute terminal process). 6th joint about same length as 4th joint, with 1 medial bristle near dorsal margin. 7th joint: a-bristle spinous, about same length as bristle of 6th joint; b-bristle about twice as long as a-bristle, with 3 marginal filaments and tip with minute process; c-bristle very long, with 13 marginal filaments and tip with minute terminal process. 8th joint: d- and e-bristles bare with blunt tips, longer than b-bristle; d-bristle slightly stouter and longer than e-bristle; f-bristle very long, similar to c-bristle; g-bristle longer than d-bristle, with 3 marginal filaments and bifurcate tip (each branch with minute terminal process). Filaments on sensory bristle and bristles of joints 7 and 8 with 1 or 2 minute processes at tip.

Second antenna: Prodopodite bare. Endopodite 3-jointed (Fig. 5a): 1st joint short with 6 bristles (5 proximal, 1 distal); 2nd joint elongate with 2 short ventral bristles; 3rd joint elongate, reflexed on 2nd, with 1 proximal bristle with pointed tip, 2 short distal bristles, and tip with few ridges. Exopodite (Fig. 5b): 1st joint elongate, spinous, with small, medial, tubular bristle on distal margin; 2nd joint short; 3rd joint about twice length of 2nd joint; remaining joints small, decreasing in size distally; bristle of 2nd joint short, reaching 7th exopodial joint, with blunt spines along ventral margin; bristles of joints 3-8 long, with natatory hairs, no spines; 9th joint with 6 bristles (3 long and 1 medium with natatory hairs, 2 minute, bare); joints 3-8 with slender, pointed, basal spines; 9th joint without lateral spine; joints 2-8 with slender spines along distal margin.

Mandible (Fig. 5c): Coxale endite consisting of 2 minute spines. Basale: medial surface spinous, with 5 proximal bristles near ventral margin and 1 additional bristle near middle of ventral margin; dorsal margin with 3 bristles (1 distal to



Fig. 5. *Alternochelata lizardensis*, adult male, paratype, USNM 158487: a, Endopodite of left 2nd antenna, medial view; b, Exopodite of left 2nd antenna (bristles of joints 2–8 not shown), lateral view; c, Right mandible, medial view; d, Distal part of basale, 1st endopodial joint, and proximal part of 2nd endopodial joint of left mandible, lateral view; e, Lateral view of distal part of left mandible showing bristles of distal ventral corner of 2nd endopodial joint, and claw and lateral bristle of end joint; f, Right maxilla, lateral view; g, Detail from f showing exopodite and endopodite; h, 6th limb; i, 7th limb.

middle, 2 subterminal). Exopodite absent. 1st endopodial joint with medial spines, 3 ventral bristles, and bulging process along dorsal margin (the latter process could, with difficulty, be interpreted as being homologous to exopodite but, in my opinion, is not). 2nd endopodial joint: medial side, ventral and dorsal margins with spines in rows; ventral margin with bristles forming 2 distal groups, 2 bristles

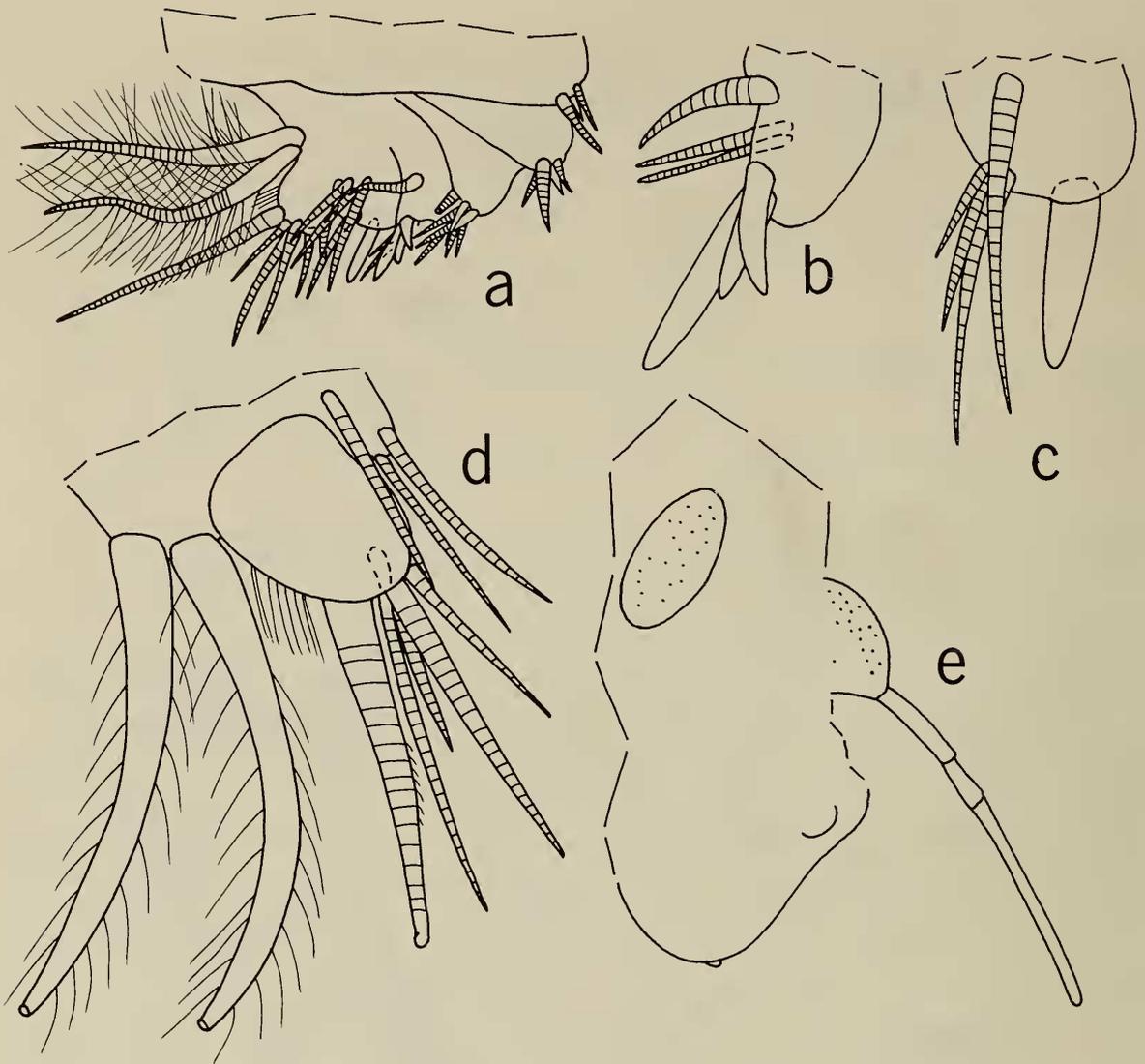


Fig. 6. *Alternochelata lizardensis*, adult male: a–d, USNM 158487, 5th limb: a, Distal part of limb (not all exopodial bristles shown); b, 1st exopodial joint; c, 2nd exopodial joint; d, Detail from a showing 3rd exopodial joint (outer lobe to left), and fused exopodial joints 4 and 5. e, USNM 158489, anterior of body from right side showing right lateral eye (ommatidia not drawn), medial eye and Bellonci organ, and upper lip with minute process.

in proximal group, 4 in distal group (the 2 distal bristles in latter group slender with bases on lateral side) (Fig. 5e); dorsal margin with 7 bristles. End joint with stout pectinate claw and 6 bristles (Fig. 5c).

Maxilla (Fig. 5f, g). Limb reduced. Dorsal margin of precoxale, coxale, and proximal part of basale with fringe of hairs. Endite I with 3 ringed and 3 unringed bristles; endite II with 2 ringed and 2 unringed bristles; endite III obscure, with 1 proximal ringed bristle and 3 long, distal, ringed bristles. Coxale with 1 hirsute dorsal bristle. Basale with 1 lateral ventral bristle, 1 medial bristle near dorsal margin, and 1 distal medial bristle. Exopodite short, with 3 long bristles (Fig. 5g). 1st endopodial joint with hairs in rows, 1 alpha-bristle and 1 beta-bristle; 2nd endopodial joint with long hairs, 5 ringed bristles, and 2 bristles with rings only distally (the latter 2 bristles stouter than others).

Fifth limb (Fig. 6a–d): Epipodial appendage with 48 bristles. Endite I with 1

unringed and 2 ringed bristles; endite II with 1 unringed and 3 ringed bristles; endite III with 1 short unringed bristle and 6 longer ringed bristles. 1st exopodial joint with 3 ringed bristles and 3 unringed finger-like bristles (Fig. 6b). 2nd exopodial joint with 4 ringed bristles and 1 or 2 long, unringed, finger-like bristles (Fig. 6c). 3rd exopodial joint with 3 slender bristles on inner lobe and 2 stout hirsute bristles on outer lobe (Fig. 6d). 4th and 5th joints fused, hirsute, with total of 5 bristles.

Sixth limb (Fig. 5h): Endite I and II each with 3 or 4 bristles (some bristles broken on endite I of illustrated limb); endite III with 4 bristles; endite IV with 3 bristles. End joint with hairs on medial and lateral surface and 7 bristles (anterior 4 bristles with short marginal spines) following bristle with long hairs except near spinous tip; posterior 2 bristles hirsute. Ventral margin of end joint linear but bases of posterior 3 bristles on small pedestals. Two subequal bristles with long marginal hairs in place of epipodial appendage.

Seventh limb (Fig. 5i): 4 short widely spaced bristles in proximal group, 2 on each side, each bristle with 2–4 bells, some bristles with marginal spines; 4 long spinous bristles in terminal group, 2 on each side, each bristle with 3–5 bells. Terminus consisting of comb with 9 alate teeth opposite 2 recurved spinous teeth.

Furca (Fig. 4h): Each lamella with 9 claws; claws 1, 2, 4, 5 stout primary claws; claws 3, 6–9 small secondary claws; claws 1 and 2 with abundant slender teeth along posterior margin (more numerous than on adult female or juvenile male); claws 4 and 5 also with posterior teeth; anterior margin of lamella with long hairs near base of claw 1 of right lamella; claw 1 of right lamella anterior to claw 1 of left lamella. Teeth on main claws not shown on illustrated limb. Left lamella of USNM 158489 aberrant in having claws 1, 2, 4, 5 and 6 main claws, and claws 3, 7–10 secondary claws.

Bellonci organ (Figs. 4i, 6e): Elongate, with short broad segment near middle, cylindrical distal part, and rounded tip.

Eyes: Medial eye bare, with black pigment (Figs. 4i, 6e): Lateral eye well developed, about same size as medial eye, with black pigment (Figs. 4f, i, 6e); ommatidia large, but number difficult to determine because of pigment (14 visible, but none shown in illustrations).

Upper lip (Figs. 4i, 6e): Anterior process present but weaker and smaller than on A-1 male or adult female.

Copulatory organ: Consisting of short lobes, some with bristles.

Y-sclerite and posterior of body: Similar to that of adult female.

Comparisons.—The new species *A. lizardensis* differs from *A. neali* Kornicker and Caraion, 1978:66 in that the carapace bears a distinct caudal process; also, furcal claws 1, 2, 3, 5 of *A. neali* are primary claws, whereas claw 3 is a secondary claw on the furca of *A. lizardensis*. The furca of *A. lizardensis* does not have a secondary claw between 2 sets of primary claws as on *A. polychelata* Kornicker, 1958:237.

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